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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SAN JOSE DIVISION

IN RE HIGH-TECH EMPLOYEE ANTITRUST LITIGATION

THIS DOCUMENT RELATES TO:

ALL ACTIONS.

No. Master Docket No. 11-CV-2509LHK

DEFENDANTS' NOTICE OF MOTION AND MOTION TO STRIKE THE REPORT OF DR. EDWARD E. LEAMER

Date: January 17, 2013
Time: 1:30 p.m.
Courtroom: 8, 4th Floor
Judge: The Honorable Lucy H. Koh

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TO PLAINTIFFS AND THEIR ATTORNEYS OF RECORD:

PLEASE TAKE NOTICE that on January 17, 2012 at 1:30 p.m., in the courtroom of the Honorable Lucy H. Koh, of the above-entitled Court (Courtroom 8), Defendants Intel Corporation, Pixar, Adobe Systems, Inc., Intuit Inc., Google Inc., Apple Inc., and Lucasfilm Ltd. (collectively "Defendants") shall and do hereby move for an order excluding the opinions and testimony of Dr. Edward E. Leamer ("Leamer"), designated by plaintiffs Michael Devine, Mark Fichtner, Siddharth Hariharan, Brandon Marshall, and Daniel Stover (collectively "Plaintiffs") as an expert witness in this matter, for his failure to provide reliable, relevant and admissible testimony under *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993) and Federal Rule of Evidence 702. Defendants' motion is based on the authorities and evidence set forth herein, the accompanying declaration and exhibits, the Report of Professor Kevin M. Murphy, the class certification and other pleadings on file in this matter, oral argument to be presented to the Court, and such other matters as the Court may consider.

I. INTRODUCTION

Dr. Leamer's testimony fails to meet the standards required by *Daubert* and Rule 702.[1] His opinions are offered to show that "all or nearly all" class members were undercompensated as a result of several bilateral agreements among certain pairs of Defendants not to cold call each other's employees. Given that assignment, Leamer made the remarkable admission at his deposition that he really can only opine with "confiden[ce]" that "most" class members, which he defined as "greater than 50%," were injured. Leamer 32:20-33:10. He also has no way of separating the injured from the uninjured. *Id.* 44:10-25, 57:5-11. Defendants submit that sworn testimony makes Leamer's entire report and all of his opinions unhelpful and inadmissible under Rule 702 and *Daubert* because, even on their own terms, they cannot support the use of common evidence to prove injury to all or nearly all class members.

[1] As discussed in Defendants' opposition to class certification, even if any of Leamer's opinions were to be admitted, they would not suffice to support certification for many reasons, including, as discussed below, because they show that a very large percentage of class members were not injured. *See Ellis v. Costco Wholesale Corp.*, 657 F.3d 970, 983-84 (9th Cir. 2011).

Beyond that, Leamer breached professional standards and failed the *Daubert* test by presenting the results of his analyses in a manner that ignores, and even conceals, the presence of very large numbers of uninjured class members (which he conceded at deposition exist). As relevant to this motion, his analysis has two steps. In Step 1, he opines that the agreements suppressed "information flow" about available jobs and compensation and slowed down the "price discovery" process, resulting in "generalized compensation suppression" for Defendants' employees. Report ¶ 11(b).[2] In Step 2, Leamer opines that generalized suppression would have been transmitted from individual employees who failed to receive a cold call resulting in greater compensation to "all or nearly all [*sic*] class members," through Defendants "somewhat rigid wage structures," which are a product of their "internal equity" policies. *Id.* 11(c).

Leamer's opinions about the effects of an alleged suppression of competition on class members' compensation are supported by no factual knowledge of competition in the labor markets he purports to address, the extent of any information suppression, or the actual effect on any class members, let alone "all or nearly all" of them. Instead, his opinions depend almost entirely on two statistical models he constructed. Leamer relies, for Step 1, on "conduct regressions" used to estimate the aggregate or "generalized" under-compensation for each class (and, he testified, answer many other questions he has not studied); and, for Step 2, on a "common factors" analysis (a regression and some charts) to support the idea that "all or nearly all" members of each class experienced that impact.[3]

Not only does Leamer's statistical work not come close to having the precision or rigor required to support his ambitious conclusions of class-wide impact, it actually shows just the opposite. Under Step 1, Leamer's centerpiece "conduct regressions" (taken at face value) show that at least some Defendants paid their employees *more because of the challenged conduct*.

[2] Deposition testimony is cited as "[Deponent] [Page:Line]". All deposition excerpts are attached to the accompanying Declaration of Susan J. Welch ("Welch Decl."). Leamer's report is cited as "Report ¶ __" (Dkt. No. 190) (sealed version lodged on Oct. 2, 2012). Defendants' expert Kevin Murphy's Report is cited as "Murphy ¶ __."

[3] Leamer has only one "conduct regression" model, but he applies it to both the All Employee Class and the Technical Class. Similarly, his "common factors" regression model is repeated over several years and for both classes. Thus, each of the two regressions is referred to at times in both the singular and plural.

This is a result of simply taking Leamer's regression model and generating results separately for each Defendant. The conclusion that the agreements caused some Defendants to pay more is the opposite of Leamer's theory and shows that the only test he has created to measure the impact of the conduct disproves Plaintiffs' claim. Leamer admitted that any such result would "raise concerns" about his model. He ran Defendant-specific tests himself but decided to report only aggregated results for all Defendants together. (pp. 11-13, below) Under Step 2, Leamer admits his "common factors" regressions cannot answer the question of class-wide impact. For that, he relies on his subjective (and highly questionable) interpretation of a few charts his staff created, but he admits *the pictures could look the same whether his opinion is right or wrong*. In other words, his opinion supporting class-wide impact is ultimately equivocal, so by definition irrelevant and unhelpful to resolve the issues before the Court. (pp. 16-22, below)

Leamer's uninformed, untested, and subjective opinions are unreliable and inadmissible.

II. LEAMER'S WORK FAILS THE STANDARDS OF *DAUBERT* AND RULE 702

The *Daubert* standard for expert opinion testimony applies at the class certification stage. *Ellis*, 657 F.3d at 982. *Daubert* "applies to all (not just scientific) expert testimony." *United States v. Hermanek*, 289 F.3d 1076, 1093 (9th Cir. 2002). Expert testimony is admissible only if "(1) [it] is based upon sufficient facts or data; (2) [it] is the product of reliable principles and methods; and (3) the expert has reliably applied the principles and methods to the facts of the case." Fed. R. Evid. 702. The expert's analysis should be "supported by the typical *Daubert* factors – testing, peer review and general acceptance." *Wagner v. County of Maricopa*, 673 F.3d 977, 982 (9th Cir. 2012). Expert testimony must be "both relevant and reliable." *Abaxis, Inc. v. Cepheid*, 2012 U.S. Dist. LEXIS 100530, at *3 (N.D. Cal.).

An expert's "conclusions and methodology are not entirely different from one another." *General Electric Co. v. Joiner*, 522 U.S. 136, 146 (1997). "[N]othing in either Daubert or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert. A court may conclude that there is simply too great an analytical gap between the data and the opinion proffered." *Id.* Thus, "a district court must examine the expert's conclusions in order to determine whether they could reliably follow

from the facts known to the expert and the methodology used." *Heller v. Shaw Indus., Inc.*, 167 F.3d 146, 153 (3d Cir. 1999); *Lukov v. Schindler Elevator Corp.*, 2012 U.S. Dist. LEXIS 88415, at *9 n.4 (N.D. Cal.) ("[W]hen an expert opinion is based on data, a methodology, or studies that are simply inadequate to support the conclusions reached, Daubert and Rule 702 mandate the exclusion of that unreliable opinion testimony.").

The issue is not whether Leamer's methodologies (*e.g.*, regression analysis) are reliable in some abstract sense, but whether his application of them is proper and reliable for the specific purposes for which his opinions are offered. *See id.* As shown in the following sections, Leamer's work cannot reliably show either "generalized" injury or any injury that would be "experienced by all or nearly all" class members. Report ¶¶ 11(b) & (c).

A. Leamer Cannot Reliably Fulfill His Role As An Expert Economist Because His Opinions Ignore The Basic Market Facts

"The role of the expert economist in antitrust cases is to apply microeconomic theory to the messy facts of a case." *Champagne Metals v. Ken-Mac Metals, Inc.*, 458 F.3d 1073, 1080 n.4 (10th Cir. 2006). Expert opinions may interpret market facts, but may not substitute for them. *See Brooke Group Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 242 (1993); *Concord Boat Corp. v. Brunswick Corp.*, 207 F.3d 1039, 1056-57 (8th Cir. 2000) (reversing admission of expert's model that failed to account for market events); *Stein v. Pac. Bell*, 2007 U.S. Dist. LEXIS 19193, at *30-31 (N.D. Cal.) (excluding expert who did not conduct independent research, interview anyone, or otherwise study market facts).

Leamer theorizes that the no cold call agreements suppressed labor market competition by reducing "information flow" and caused class-wide effects on Defendants' setting of compensation. His theories have no application to "the messy facts of [the] case" because he does not know them or, to the extent he does, they contradict his opinions. Leamer can point to no facts to support his opinions with respect to:

- *The labor markets in which Defendants compete*. Although Leamer admits competition for the class members in this case takes place in many different labor markets, he has not defined or studied any of them. Leamer 33:13-19. He also does not know the

companies Defendants competed with to recruit and hire employees (*id.* 68:10-69:5), although he admits "lots and lots of" companies were "poaching" Defendants' employees throughout the class period. *Id.* 60:12-21. He admitted the market for college graduates is "more likely to be a competitive market," though he hasn't "studied" it, so that during their first year of employment new hires might be "unaffected by the cold calling" agreements, and thus uninjured. *Id.* 159:21-161:13. Nevertheless, thousands of recent graduates are proposed class members.

- *The degree of competition among Defendants for labor, whether measured by hiring or cold calling.* Leamer opined that Defendants primarily competed for labor with their respective product market competitors, but did not know whether any of the Defendants were product market competitors or not. Leamer 61:19-62:4, 454:5-15. He acknowledged, however, that "the majority" of Defendants' employee gains and losses both during and outside the class period "definitely" were from and to non-defendants. *Id.* 79:3-10; *see also id.* 74:4-11 (document Leamer relied on showed the "vast majority" of gains and losses were from and to non-defendants). In fact, *only 1%* of Defendants' employee hires and losses both during and outside the class period were from and to other Defendants. Murphy, p. 8, Table 1. Leamer nevertheless conceded that Defendants, even those with cold calling agreements, were "poaching" (hiring) from each other during the class period (Leamer 60:12-25, 76:2-21); and that Defendants without agreements were also cold calling each other's employees. *Id.* 106:3-6.
- *Which firms Defendants considered in setting compensation*. Leamer admitted, however, that Defendants competed with many, many companies and had to set compensation accordingly. Leamer 60:12-21, 86:4-12. Given that concession, Leamer could not "produce a story that would justify" how Defendants could, on his theory, pay 10-20% below competitive market rates during the class period yet still attract employees. *Id.* 400:11-17, 400:23-401:9, 435:21-24. The simple fact that Defendants successfully hired some *40,000 new workers* during the class period proves the implausibility of Leamer's

claim that their average salaries were suppressed by as much as 20 percent. Murphy, p. 6 (Opinion 1).

- *The level of information either transmitted or suppressed, during the class period*. Leamer admitted he has no data on whether the frequency of cold calls increased or decreased. Leamer 52:11-20.[4] He admitted "[t]here's a long list of additional ways of finding out about the opportunities" in the labor market (*id.* 188:25-189:8); and that all of the hiring, and associated cold calling, that was happening "each and every day" both across Defendants and with their many labor market competitors during the class period gave rise to the "information flow and price discovery" and "internal equity" that his theory posits was somehow suppressed. *Id.* 79:3-18, 109:3-11. As Leamer put it, "the conduits are open, not closed. And how many cold calls they got, I don't know." *Id.* 106:7-13. Leamer is "proceeding on the assumption" that the agreements reduced Defendants' total cold calls, but admits he has no data to support that assumption. *Id.* 53:7-14, 148:1-6. He also did not know whether those assumed lost cold calls were simply replaced by calls from other technology companies. *Id.* 413:21-24. He further conceded "it's a possibility," and he could not "rule it out," that if Defendant A had an agreement with Defendant B, it would simply have made more cold calls to other companies and, specifically, *would be more likely to cold call employees at Defendants C-G*. *Id.* 470:7-21.
- *How his hypothesized additional information flow in the but for world could have rippled throughout the Defendant companies (much less the entire market) to raise all class members' compensation*. Leamer theorized that Defendants' "rigid wage structures" and "internal equity" concerns would cause that result, and claimed that "high-level

[4] Leamer claimed he did not have sufficient data on cold calling or "with regard to posting and advertisement, etc." to allow him to "unscramble forms of these relative source[s] of information to determine which one … is critical for the price discovery process." Leamer 190:10-191:1. This is a complicated way of saying he has no idea whether cold-calling is important relative to those other forms of recruiting. He also had no information on "the frequency at which buyers and sellers got together to haggle over the price during the class period," which his Report identified as significant to his "price discovery" theory. *Id.* 407:10-408:3; Report ¶ 72.

management established ranges of salaries for grades and titles, which left relatively little scope for individual variation." Leamer 466:3-12. He admitted, however, that he "can't say for sure all" that all Defendants actually had salary ranges (*id.* 466:13-19), and that "perhaps 'relatively little' is an overstatement." *Id.* 469:22-470:3. [redacted] *Id.* 468:22-469:2.[5]

- *Whether, under his theory, some class members actually benefited as a result of the no cold call agreements*. Leamer does not claim any jobs went unfilled. Leamer 90:10-18, 143:15-19. The people who filled them would have been worse off if increased cold calling caused them to lose out in favor of someone else. For example, if Apple could not cold call Adobe employees, so that a Microsoft employee got a job at Apple in the real world that an Adobe employee would have gotten but-for the agreement, the Microsoft employee (a class member) benefited. Leamer admitted that was "a possibility," but refused to opine whether it was true. Leamer 143:1-144:17. It is undeniably true, and a significant predominance problem. Murphy, pp.9-10 (Opinion 3).[6] He also admitted another major predominance problem: because Defendants have "budget constraint[s]," "some employees get smaller raises if other employees get larger raises." Leamer 151:1-5. Thus, any greater compensation to some employees absent the agreements could have meant less for others. Murphy ¶¶ 87-88.

[5] Leamer relies heavily on the "Big Bang" wage increase at Google in 2010, after the "conduct period," to support his theory of class-wide harm (Report ¶¶ 107-19), but that market fact actually refutes his theory. Leamer does not claim any other Defendant raised its compensation in response to that well-publicized development, notwithstanding Google's marketplace significance and Leamer's finding that other Defendants "paid close attention" to it. *Id.* ¶ 118. Murphy's analysis shows there was no such common wage hike. Murphy App'x 3A-B. Leamer further admits no other Defendant *ever* made an "across-the-board increase in compensation at any time"; Google's action was "unusual and unique." Leamer 460:7-22.

[6] Leamer's claim that Apple would have paid more (Leamer 144:18-145:3) is logically and economically irrelevant. Absent the challenged agreements, the employee would not have been working at Apple. She would have remained at Microsoft. Murphy, fn. 44.

- *What the named plaintiffs, who compete in the relevant labor markets, have to say about the facts*. Leamer did not interview the named plaintiffs or read their depositions (Leamer 17:3-5, 20:10-12), in which they freely admitted, among other things, the "very, very, very, very broad range of companies" competing for their services, which "would not be limited to technology companies," but would include "any company that has software," Fichtner 118:3-12, 197:14-18; Devine 96:2-97:2, 97:10-11; Hariharan 179:23-180:17, 181:11-17; the myriad sources of information at their and their colleagues' fingertips about available jobs and compensation throughout the class period, Marshall 122:12-123:1, 123:11-15; Stover 176:11-178:10, 214:7-215:18; the significant discretion individual managers had to set compensation, Fichtner 65:5-21; the budget constraints that would have both benefited and harmed class members upon Leamer's theory (*id.*); and that, "from a probability point of view," a cold call agreement between Defendants A and B would have caused them to re-direct their cold calls to employees of C-G, among others. *Id.* 147:7-19; *see also id.* 143:19-144:21.

Leamer's lack of knowledge or analysis leads him to absurd conclusions. He testified that a single additional cold call, resulting in greater compensation to the one individual who received it, could have "trigger[ed] a higher level of compensation for all employees." Leamer 124:7-13. Because he conceded that Defendants compete for employees not just with each other, but in (various broad but undefined) labor markets, he had to climb even farther out onto the limb: "the suppression of information about the job opportunities is going to be suppressing compensation, *not just of the defendants, but elsewhere as well*." *Id.* 146:9-17 (emphasis added); *see also id.* 147:18-20 ("those Microsoft employees are also being impaired … by the limited information flow"). Thus, in Leamer's opinion, any suppression of information, even just one cold call, would reverberate not just class-wide, but throughout all of the vast but unknown labor markets in which Defendants compete. Leamer's butterfly-in-the-Amazon theory of impact is unsupported by any evidence, untested, unstudied, and, at best, unreliable "armchair economics."

Menasha Corp. v. News Am. Mktg. In Store Servs., Inc., 354 F.3d 661, 664 (7th Cir. 2004) (economist opinion inadmissible where it was untested and unsupported by the evidence).[7]

Because Leamer does not know the critical market facts underlying his opinion that (a) Defendants' agreements actually, or conceivably could have, materially reduced the "information flow" he claims gives rise to the "price discovery" on which his theory depends, or (b) any such reduction could have produced a class-wide, as opposed to highly individualized (both positive and negative) effect, Leamer's opinions are not "tied to the facts of the case" and thus unhelpful to the Court's class certification decision. F.R.E. 702; *Daubert*, 509 U.S. at 591; *LaserDynamics, Inc. v. Quanta Computer, Inc.*, 2011 U.S. Dist. LEXIS 42590, at *6-8 (E.D. Tex.) (excluding opinion where "expert offer[ed] no credible economic analysis to support [his] conclusion"). To the extent Leamer knows the market facts, they contradict those opinions. An expert opinion contrary to the facts has no relevance and is inadmissible. *See Concord Boat*, 207 F.3d at 1057 (reversing admission where opinion "did not incorporate all aspects of the economic reality of the [relevant] market"); *Heary Bros. Lightning Prot. Co. v. Lightning Prot. Inst.*, 287 F. Supp. 2d 1038, 1065-66 (D. Az. 2003) (excluding expert opinion where his assumptions contradicted the market facts in the record).

B. Leamer's "Conduct Regression" Is Deeply Flawed In Its Methodology And, Properly Considered, Shows That There Was No Class-Wide Injury

Leamer's response to all of the unknown and unsupportive market facts is to "fall back" to his "conduct" regression (Leamer 429:7-16), which he claims also estimates the relevant market (*id.* 55:17-56:3), the level of competition among Defendants for labor, whether the agreements were enforced, and how broadly they were interpreted (*id.* 182:4-14, 182:21-183:6); the effects of the *assumed* fewer cold calls and/or reduced information flow during the class period (*id.* 80:7-25, 114:1-16), and the timing of those effects (*id.* 100:21-101:2). "Multiple

[7] Another economically senseless implication of Leamer's theory is that if any Defendant cold called and then hired an employee at 25% above its existing compensation "structure," it would have to raise all employees' compensation by 25%. That would turn a simple hiring decision into a multi-million dollar (or more) endeavor (for example, $25,000 x 4,000 employees = $100,000,000). Murphy ¶ 100. Why would any company make that hire?

regression analysis is not a magic formula." *Piggly Wiggly Clarksville, Inc. v. Interstate Brands Corp.* 100 Fed. Appx. 296, 299-300 (5th Cir. 2004). Leamer's cure-all conduct regression is not the product of a reliable methodology, so it and the essential opinions Leamer derives from it are inadmissible. *See Group Health Plan, Inc. v. Philip Morris USA, Inc.*, 344 F.3d 753, 760 (8th Cir. 2003) (expert testimony was premised on a "counterfactual world" and "entail[ed] a great deal of speculation, for although his estimations [we]re oriented in real-world examples and data points, his use of them often involve[d] inferences that approach[ed] leaps of faith").

Leamer's methodology, broadly speaking, is to compare Defendants' compensation during the class or "conduct" period to their compensation before and after that period. He presents two before-and-after comparisons: one is illustrated in his Figure 19 and the other is the product of his "conduct regressions." Report ¶¶ 138-41. He testified Figure 19 has no independent significance, but is just "a warmup … to the regression analysis" and is "relevant to your understanding of my opinion" to "illustrate … the before and after kind of calculation that's implied by the conduct variables" in the conduct regression. Leamer 376:14-377:2. The conduct regression, he explained, is "a much more sophisticated way of identifying before and after." *Id.* 378:21-22. However, both analyses suffer from the same basic problem (among many others): Leamer's methodology actually shows *large portions of the class were not injured*. This is not a matter of interpretation or theory; it is a direct and provable outcome of Leamer's own work.

1. Figure 19

In Figure 19, Leamer defines the years 2005-2009 as "conduct" years, meaning they are during the effective period of the challenged agreements, and the other years (2002-04 and 2010-11) as non-conduct years. Leamer uses Figure 19 to illustrate the hypothetical average under-compensation (9.5% to 12.9%, depending on the year) for all Defendants collectively during the "conduct" period. Report ¶ 63. He does not report the figures for each Defendant separately. Murphy has done so, using Leamer's exact methodology, and the results show that *five* of the Defendants *paid higher compensation increases during the conduct years* than the non-conduct years. Murphy ¶¶ 107-09. This is a striking result. It is not a situation where a few isolated employees may have done better during the conduct years. Here, for entire Defendants,

Leamer's method shows the opposite of impact. [redacted]

[redacted]

2. The Conduct Regressions

Leamer's conduct regression is much more complex, but suffers from the same basic flaw. Generally speaking, a "regression model" is a statistical method for using data to understand (or "estimate" or "predict") the average relationship between one or more factors (represented in the model by "independent variables") and a "dependent" variable. In this case, Leamer used compensation data during the "conduct" period and the periods before and after to try to identify the average effect of the challenged agreements on compensation (the "dependent" variable), taking into account the effects of other independent "control" variables (e.g., seniority, San Jose employment levels). Report, Figures 20-21. He refers to the estimated average effect of the agreements as the "coefficient" on his "CONDUCT" independent variable. *Id.* ¶ 146. From that, he calculates an average alleged under-compensation by Defendant by year for each class. *Id.*, Figures 22 & 24. A regression, by its nature, can only estimate an average relationship between a dependent and independent variable. Leamer 163:3-6, 249:10-14.

Leamer admits it is "important" to test a regression model's "sensitivity" "before you rely on it." Leamer 351:1-3, 356:1-7, 358:19-24. He has written a peer reviewed article stating as much. *See* Edward E. Leamer, *Let's Take the Con out of Econometrics*, 73 Am. Econ. Rev. 31, 38 (1983) (Welch Decl., Ex. G). A "sensitivity" analysis is "an exploration of how sensitive the conclusions are to a choice of variables" included in the model. Leamer 351:4-6. Leamer did not run a "formal" or "complete" sensitivity analysis. *Id.* 352:15-19, 356:8-20. He did, however, consider the model's sensitivity, and admitted "there's some dimensions of variability in which the changes can be substantial" (*id.* 356:8-20) and thus "*the conclusions will change substantially*." *Id.* 357:25-358:14 (emphasis added). The "largest sensitivity" "has to do with disaggregation" by Defendant, or in other words running the model separately for each Defendant rather than "pooling" them all together. *Id.* 358:25-359:3, 360:9-18, 369:4-9. Leamer

does not "remember the details" of how that test turned out and did not disclose that in his report. *Id.* 360:23-361:4.[8]

Thus, Leamer's regression repeats the error that his Figure 19 "illustrate[s]." Leamer 376:14-377:2.[9] Leamer estimated a common under-compensation percentage (the "CONDUCT coefficient") for all Defendants collectively, then made adjustments for each Defendant based on the age of its employees and how much hiring it did each year. *Id.* 398:16-20, 398:24-399:4. So, when Leamer reports under-compensation by Defendant by year (e.g., 8.40% for Google in 2008; Figure 22), much like in Figure 19, that does not mean his model estimates that each Defendant under-compensated its employees each year. It does not. Instead, he just assumed each Defendant had the same basic under-compensation he calculated for Defendants as a whole. Assuming one's conclusion is not reliable science. *See Menasha*, 354 F.3d at 665-66 (it was possible to test the expert's opinion, but he defined a relevant market by assumption, not testing; "Garbage in. Garbage out."); *Craftsmen Limousine, Inc. v. Ford Motor Co.*, 363 F.3d 761, 777 (8th Cir. 2004) (error to admit expert report where it assumed the conclusion and failed to analyze relevant factors).

Murphy has run Leamer's regression model for each Defendant separately, but otherwise replicating Leamer's methodology. The results are remarkable. Of the seven Defendants, *two show over-compensation in all years*, and three (including the two largest Defendants) show a mix of over- and under-compensation depending on the year. Murphy ¶¶ 116 Ex. 20. The same results generally follow for both proposed classes. *Id*. Stated plainly, that means Leamer's own model implies that in about half the Defendant-years that he purported to analyze, Defendants *overpaid* their employees *because of the alleged conspiracy*. Therefore, Leamer's model cannot

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[8] Leamer claimed it was "more efficient" to "pool" all the defendants together in one model because he found them "sufficiently similar" to avoid any "inaccuracy," based on "eyeballing" the regression's results. Leamer 364:8-365:1, 365:14-366:2. There is a "formal test" to determine whether Leamer's pooling decision was sound, but he did not run it. *Id.* 365:8-16. In fact, when the results are separated by Defendant, they are not similar at all. Murphy ¶¶ 115-119 & Ex. 20.

[9] As discussed in this brief and in Murphy's report, Leamer's methodology has many conceptual and methodological flaws, but this analysis accepts his basic methodology and asks whether it actually shows under-compensation by all Defendants, as Leamer has reported.

be used to show injury to all class members because, on its own terms, it shows that large portions of the class were not injured. *Id.* ¶ 119. Leamer admitted such a result "would raise concerns" about "the conceptual framework and the appropriateness of the model." Leamer 472:23-473:7. It does indeed. It also demonstrates that Leamer's failure to run the model separately for each Defendant was poor science, given that he is supposed to be showing injury to all class members, rather than just some average injury for an aggregated class. *See GPU,* 253 F.R.D. at 504 (criticizing plaintiffs' reliance on regressions, finding that they "would either be overly reliant on averages and would thus sweep in an unacceptable number of uninjured plaintiffs, or they would be unmanageably individualized.").

Leamer's model is also highly sensitive in two other key respects. First, using only the post-conduct period (not the pre-conduct period) as a benchmark, which should not change Leamer's findings if his theory were correct, in fact reverses them. The estimated "effect" is *overcompensation for each of the seven defendants* - the exact opposite conclusion to the one Leamer reached. Murphy ¶ 132 & Ex. 23. Second, even though equity was an important component of many employees' compensation, Leamer does not control for changes in the value of that equity compensation over time. His failure to control for obvious factor affecting compensation caused the model to erroneously attribute compensation changes to the alleged agreements. Murphy ¶¶ 134-137. Simply adding the change in the S&P 500 as a "control" variable alters his results dramatically. Murphy ¶ 137 & Ex. 26. These results, according to Leamer himself, indicate that his regression's conclusions are "fragile" and "not to be believed." *See* Podcast: Leamer on the State of Econometrics (May 10, 2010) (http://www.econtalk.org/archives/2010/05/leamer_on_the_s.html) (An economist requires "a *complete model with all the controls*"; "*That's a sensitivity issue* - we want to make sure that an adequate range of alternative models has been studied and confirmed that all the reasonable models lead to about the same conclusion, which is that you get the sturdy inference. Or, *if what seem like small changes in the models, the kinds of things that economists would be willing easily to entertain, lead to dramatically different conclusions – that's a fragile estimate, and not to be believed*.") (emphasis added).

In sum, Leamer's regression methodology is unsupported by any of "the typical *Daubert* factors." *Wagner*, 673 F.3d at 982. It is not "generally accepted," but was "conceived, executed, and invented solely in the context of th[e] litigation"; indeed, its purported use expanded as Leamer was confronted at deposition with more issues he had failed to analyze. *See Johnson v. Manitowoc Boom Trucks*, 484 F.3d 426, 434-35 (6th Cir. 2007); *Daubert v. Merrell Dow Pharms.*, 43 F.3d 1311, 1317 (9th Cir. 1995) ("*Daubert II*") ("One very significant fact to be considered is whether the experts are proposing to testify about matters growing naturally and directly out of research they have conducted independent of the litigation, or whether they have developed their opinions expressly for purposes of testifying."). Leamer failed to report the results of his "sensitivity" analysis used to test his model's reliability, but admittedly the model's "error rate," *Daubert*, 509 U.S. at 594, is high, because examining the "largest sensitivity" he identified disproves the conclusion he did report.[10] His methods also violate his own repeated peer-reviewed admonitions as to how proper econometrics should be performed. *See Apple, Inc. v. Samsung Electronics Co.*, 2012 U.S. Dist. LEXIS 90877, at *29 (N.D. Cal.) (opinion excluded where no evidence showed expert's calculations were based on a generally accepted, peer-reviewed methodology).

Taking a step back, it is also important to keep in mind what Leamer's statistics are purporting to say, which is that an assumed but unknown reduction in "information flow" from these narrow restrictions on cold calling achieved a remarkable under-compensation of 2-20%. Report, Figures 22, 24. Therefore, upon Leamer's theory taken at face value, one of two things must be true. The first is that the relative handful of allegedly lost cold calls amidst the vast sea of "information flow" and "price discovery" that he admits was occurring "each and every day" during the class period allowed Defendants to suppress their compensation significantly below

[10] Leamer's own peer-reviewed article shows his methods applied here are not accepted or reliable. "Can we economists agree that it is extremely hard work to squeeze truths from our data sets and *what we genuinely understand will remain uncomfortably limited*? We need words in our methodological vocabulary to express the limits. *We need sensitivity analyses to make those limits transparent. Those who think otherwise should be required to wear a scarlet-letter O around their necks, for 'overconfidence.*'" Edward E. Leamer, *Tantalus on the Road to Asymptopia*, 24 J. Econ. Persp. 31, 32 (2010) (Welch Decl., Ex. H) (emphasis added).

market levels but still retain their employees [redacted] The alternative is that the hypothesized few lost cold calls managed to suppress compensation *in the entire vast labor markets in which Defendants competed* - at Microsoft, Facebook, Oracle, Amazon, Applied Materials, Electronic Arts, IBM, HP, eBay, Zynga, all startups, indeed "any company that has software." That fanciful market suppression would not be limited to software engineers like the plaintiffs, but would extend to accountants, administrative assistants, attorneys and a very long list of other employees, of which Defendants employ a tiny percentage. Neither scenario makes any economic sense, and Leamer does not and cannot defend either one. The admissibility of his work must be evaluated in light of its necessary implications. *See Joiner*, 522 U.S. at 146 (opinion inadmissible where "there is simply too great an analytical gap between the data and the opinion proffered").[11]

3. Leamer's Methodology Underlying His Conduct Regressions Is Inconsistent With His Other Necessary Opinion

Leamer built the conduct regression model based on a key assumption that is directly contrary to his own opinion of a "somewhat rigid wage structure." The contradiction arises from the fact that, for purposes of the conduct regression, Leamer treated each employee's data as if it provides *independent* information about the factors affecting compensation. That assumption squarely contradicts his other central theory that compensation within each Defendant is driven by "common factors" (i.e., is not independent, but correlated). Leamer cannot take conflicting positions with respect to his two central opinions. *See Group Health Plan*, 344 F.3d at 761 (affirming exclusion where "the disconnect between [the damages expert's] work and the

[11] Leamer's regression analysis essentially assumes what he is trying to prove. Apart from his few "control" variables, he simply attributes any supposed difference in compensation during the class period to the agreements, with no analysis of whether they actually had, or plausibly could have had, any class-wide (or marketwide) effect on "information flow" or "price discovery," the number of cold-calls, the amount of "haggling," the number of job changes, the level of cross-hiring among defendants, or anything else he admits is relevant but does not know. Because the regression is not grounded in the evidence or any coherent theory based on the market facts, it is, at best, circular. *See In re TFT-LCD (Flat Panel) Antitrust Litig.*, 2012 U.S. Dist. LEXIS 21696 (N.D. Cal.) ("Obviously, a model cannot be used to prove of one of its basic assumptions.").

[plaintiff's] theory of liability weighs heavily against the admission of his testimony under *Daubert*"). Leamer admitted the possible inconsistency between his opinions, but hadn't thought about it and refused to opine about its implications. Leamer 334:18-25.

Leamer's data independence assumption is necessary for the conduct regression to achieve "statistical significance." Murphy ¶ 120. His error, and its importance to any conclusion that can be drawn from his regression, is easily proved. A generally accepted method to take into account the fact that the observations on which the conduct regression is based reflect "groups" of observations that have some (although not complete) correlation is called "clustering" the standard errors. Murphy ¶ 125. Leamer failed to implement this (or any other) methodology to address the nature of his data, although he has mocked econometricians who rely on an erroneous assumption of data independence to achieve statistical significance. *See Let's Take the Con out of Econometrics* (Welch Decl., Ex. G), at 37-38 ("Sometimes I take the error terms to be correlated, sometimes uncorrelated. … Does it depend on what I had for breakfast?").[12] Once that is done, so that the illusion of independence is removed, Leamer's conduct regression model produces no statistically significant result. Murphy ¶ 127 & Exs. 22A-B. Therefore, his regression results, and his opinions based on them, are scientifically unaccepted and unreliable according to his own peer review.

C. Leamer's "Common Factors" Analyses Are Deficient And Unreliable

Leamer's second essential opinion derives from his "common factors" or "compensation structure" analyses, which consist of additional regressions (separate from the conduct regressions) and some charts. Report ¶¶ 120-34. They purport to show that all Defendants' compensation, due to "internal equity" considerations, follows a "somewhat rigid" structure." Leamer 201:5-18. Thus, Leamer opines, compensation for the class members "tended to move together over time and in response to common factors." Report ¶ 130. Therefore, he concludes,

[12] Leamer has also referred to that practice as "counting your wealth in small change," which refers to "an illusion of greater observations, not the reality of it." Leamer 374:6-18. He admitted it "seems like appropriate use of that language" to describe "having lots of individuals but only having one experiment at a firm." *Id.* 375:13-24. That is exactly what he did here. Murphy ¶ 122.

"any generalized suppression of compensation due to the Agreements would be experienced by all or nearly all members of the" two putative classes. *Id.* ¶ 11(c); *id.* ¶ 64 ("compensation of employees tended to move together over time, such that the effects of Non-Compete Agreements are likely to be broadly felt").

Leamer's "common factors" analyses, like his conduct regressions, are the product of unsound methods, carefully designed and subjectively interpreted to suggest a result that is contrary to the real-world evidence. In the end, Leamer admits they actually cannot distinguish between two opposite conclusions; thus, they are not relevant to any issue before the Court. *See Daubert*, 509 U.S. at 591.

1. Leamer's "Common Factors" Regressions, By Themselves, Do Not Purport To Answer The Relevant Question

Leamer reports that his "common factors" regressions reveal that the factors he chose to include (the "independent variables") can explain most of the variation in employee compensation (the "dependent variable") *at a single "point in time."* Report ¶¶ 129-30 (emphasis added).[13] Even if that were true, his approach is irrelevant to the issue before the Court, as Leamer himself defines it, because he admits they do not show "*changes of compensation over time*," even within any job title. Leamer 218:6-8, 236:15-22 (emphasis added). Therefore, they cannot address the issue for which they are offered, which is whether different employees' compensation "move[s] together over time" (*id.* 206:11-17, 207:3-5), so that one employee's increased compensation from a cold call would cause an increase in "all or nearly all" other employees' compensation.

[13] Leamer's claim the regressions explain "almost the entire variation in salaries within each firm" is untrue. On their face, they fail to explain as much as 38% [redacted] Report, p.58 (Figure 14). He had to admit that "there's a lot of individual variation that is not accounted for at Google in any of the years in the class." Leamer 303:12-15. Moreover, because of the nature of Leamer's statistical analysis, the "explained" percentages in Figures 12 and 14 *do not* reveal the *actual* unexplained variation of compensation *in dollars*, which would be much greater. *Id.* 217:16-22.

Consider this simplified example of three employees with the same job title:

	Year 1	Year 2
Employee A	$130,000	$120,000
Employee B	$125,000	$125,000
Employee C	$120,000	$130,000

In this example, the *variation* in compensation *at each "point in time,"* which is all that Leamer's "common factors" regression shows, is the same because within each year one employee makes $130k, one makes $125k, and one makes $120k. But the individual employees' compensation does not "move together over time," which is the relevant issue. Leamer 206:1-17. The compensation of Employees A and C are moving in *opposite* directions over time.[14]

Moreover, the class consists of employees with thousands of *different* job titles. Leamer admitted the regressions cannot answer the relevant question of "whether salaries of two employees with two different job titles are correlated with each other over time," but explained "*that's why we did Figure 15 and 16*." Leamer 235:21-236:2 (emphasis added); Report pp. 59-60. As explained below, those analyses - the admitted linchpin of Leamer's "common factors" analysis - prove that it is entirely unsupported and unreliable.

2. Leamer Admits Figures 15 and 16, On Which He Relies, Cannot Answer the Relevant Question

According to Leamer, Figures 15 and 16 in his Report, along with Figure 17, support his "wage structure" opinion because they show that average compensation for a few "major" job titles at Apple and Google exhibit "smooth movement over time." Leamer 245:12-23. Both Leamer's premise and - he ultimately admits - his conclusion are unreliable and incorrect.

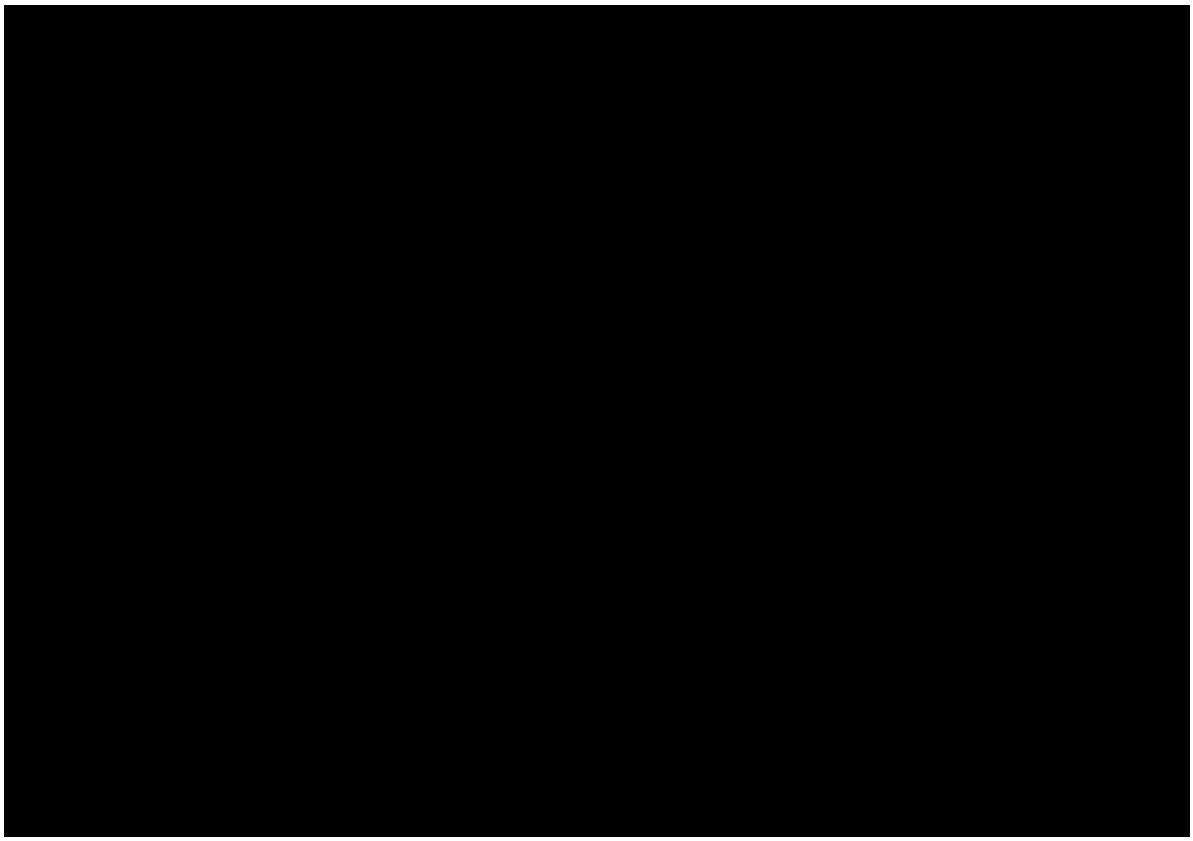
[14] The common factors regression contains another basic flaw. Assume a firm has only two job titles: a junior position paying $100k and a senior position paying $150k. This is a perfectly rigid pay structure, far beyond anything Leamer has found here. But even under these extreme circumstances, Leamer's approach proves nothing. Assume a junior employee receives a cold call and, in response, the firm promotes him to a senior position paying $150k. There is no ripple effect whatsoever. The firm's rigid pay structure allows it to respond to the cold call by giving that employee, and only that employee, a promotion. Nothing in its structure requires it to raise any other junior employee's pay. And, it makes a lot more sense to give just this one employee a $50k promotion rather than Leamer's assumed outcome that the firm would keep him as a junior employee and raise his pay, and that of every other junior employee.

First, Figures 15-17 are biased in Leamer's favor but still do not support his conclusion. In all three charts, Leamer has averaged all employees within each job title depicted; they do not show actual compensation for anyone. *Id.* 248:22-249:2. This reliance on averages is inappropriate to begin with, because it obscures the key question Leamer identifies of whether "all or nearly all" class members' compensation "moves together over time." *See GPU*, 253 F.R.D. at 494 ("Averaging masks the differences and by definition glides over what may be important differences."); *Reed v. Advocate Health Care*, 268 F.R.D. 573, 591 (N.D. Ill. 2009) (expert's reliance on averages was a "fundamental flaw" because variations in pay are central to class certification analysis).[15]

Even so, Leamer's charts still show many examples where the compensation of entire groups of employees (by title) moves in different directions or moves in the same direction but at very different rates, such that the lines cross. This is the *opposite* of his claim that compensation "moves together" and the charts show "smooth movement over time." [redacted] Many other job titles' average compensation lines were also crossing, and certainly not "moving together."[16]

[15] Leamer *never* shows the range of pay *within* any job title. Murphy's exhibits show that compensation within job title varies significantly from Leamer's averaged regression results. Murphy Exs. 15A-B, Murphy App'x 7A-D.

[16] [redacted]



Despite these obviously disparate movements over time, Leamer swore "these things behave in … what I would consider a very parallel fashion." *Id.* 267:15-268:6. Similarly, he claimed Figures 15-17 "illustrat[e]" his opinion that the results of his year-by-year regressions "did not vary substantially over time," a necessary predicate for his opinion that "the compensation structures were relatively stable over time." Report ¶ 130; Leamer 235:21-236:2, 245:24-246:9. He admitted, however, that conclusion was his "judgment call" based on "eyeball[ing]" but not testing the results, and that he didn't actually "look at" all the data "carefully" "to evaluate" whether the results did, in fact, "vary substantially." Leamer 219:1-24, 220:20-221:10, 221:20-222:1, 225:2-13. He also admitted that two econometricians "eyeballing a graph, such as this, [could] come to a different conclusion as to the smoothness of the movement over time." *Id.* 292:17-21. Leamer's subjective judgments about the charts he chose to display, which were "not carefully" reached, are untested, untestable, and have an admittedly high "error rate" because two experts could simply disagree about how the charts look. *See Daubert II*, 43 F.3d at 1319 (opinion inadmissible when based on personal opinion, not science);

Oddi v. Ford Motor Co., 234 F.3d 136, 158 (3d Cir. 2000) (opinion inadmissible where expert "used little, if any, methodology beyond his own intuition").

Leamer's methodology gets worse. First, he delegated to his staff the decision of which companies and job titles to portray in the charts, with no knowledge of how they were chosen (Leamer 260:2-9, 260:23-261:13, 272:19-22), or any effort to ensure they are representative of the thousands of jobs in the class - not just for Apple and Google but for *all* Defendants - except that he "asked them not to do cherry picking, obviously." *Id.* 265:5-17. He admitted compensation for some job titles, such as engineers and accountants, might "violate" his theory of moving together, [redacted] *Id.* 261:14-23, 262:3-10. Those disparities are, Leamer admitted, relevant to his opinions (*id.* 265:5-8), and "if there is a complete mish-mash, things are going up and down, that definitely matters" because "[i]t would mean that the regressions wouldn't speak to the point" of a "somewhat rigid wage structure." *Id.* 268:18-269:6, 269:25-271:14. Then Leamer conceded that, in fact, "there are significant numbers of other job titles that may not be consistently smooth," but still maintained that "has not impacted my opinion." *Id.* 274:3-17. The reason: he didn't bother to look into "similar anomalous behavior" his staff identified because "in the heat of the moment, … I was relying on [the staff] to confirm the overall preponderance of the evidence supported the parallelism [*sic*] that they produced in these … diagrams that you see in front of you." *Id.* 275:13-22.

Thus, Leamer cannot say whether the evidence actually comports with his subjective "parallelism" standard (even if that standard were reliable to begin with), or is, in fact, the "mish-mash" that would undo his regression results. 277:8-21, 278:5-24. Placing blind faith in staff members "in the heat of the moment" is not reliable science. *In re TMI Litig.*, 193 F.3d 613, 715-16 (3d Cir. 1999) (affirming exclusion where expert's "failure to assess the validity of the opinions of the experts he relied upon together with his unblinking reliance on those experts' opinions, demonstrate[d] that the methodology he used to formulate his opinion was flawed under Daubert as it was not calculated to produce reliable results"); *TK-7 Corp. v. Estate of*

Barbouti, 993 F.2d 722, 732 (10th Cir. 1993) (opinion inadmissible where expert's "lack of familiarity with the methods and the reasons underlying [non-testifying expert's] projections virtually precluded any assessment of the validity of the projections through cross-examination").

Finally, and most importantly, Leamer admitted his entire "common factors" analysis proves nothing anyway, because a "nonrigid wage structure" - one that is "indifferent to internal equity issues" - could lead to the very same "parallel" lines that he claims Figures 15 and 16 depict. Leamer 282:11-22, 283:23-25. In other words, the graphs Leamer relies on as the linchpin of his "internal equity" analysis *cannot distinguish between his theory and the exact opposite conclusion.* Therefore, the entire equivocal exercise collapses into a massive analytical gap between Leamer's opinion and the supposed support for it. *See Joiner*, 522 U.S. at 146.

Leamer's "common factors" analysis cannot and does not answer the question he identifies as relevant, so it does not "fit" any issue in the case and, in any event, is subjective, unreliable and therefore inadmissible several times over. *See Daubert*, 509 U.S. at 591; *In re TMI Litig.*, 193 F.3d at 670 (reversing admission of opinion unconnected to "the particular disputed factual issues in the case").

III. CONCLUSION

Leamer's opinions relating to both "generalized" and "class-wide" impact are unreliable, and should be excluded.

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